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- (71) Applicant (for all designated States except US):
WAVBANK, INC. [US/US]; P.O. Box 2726, Del Mar, CA 92014 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **BUTTERS, Ben-**
nett, M. [US/US]; 3421 Stikes Drive SE, Lacey, WA 98503 (US). **NAUGHTON, Patrick** [US/US]; 4461 East Glendale Road, Clinton, WA 98236 (US). **LEONARD, Michael** [US/US]; 1775 Diamond Street #133, San Diego,

CA 92109 (US). **VOREADES, Demetrios** [—/US]; 2330 Bancroft Street, San Diego, CA 92104 (US). **CALIXTO DE ANDRADE, Marcio** [—/US]; 3431 Villanova Ave., San Diego, CA 92122 (US).

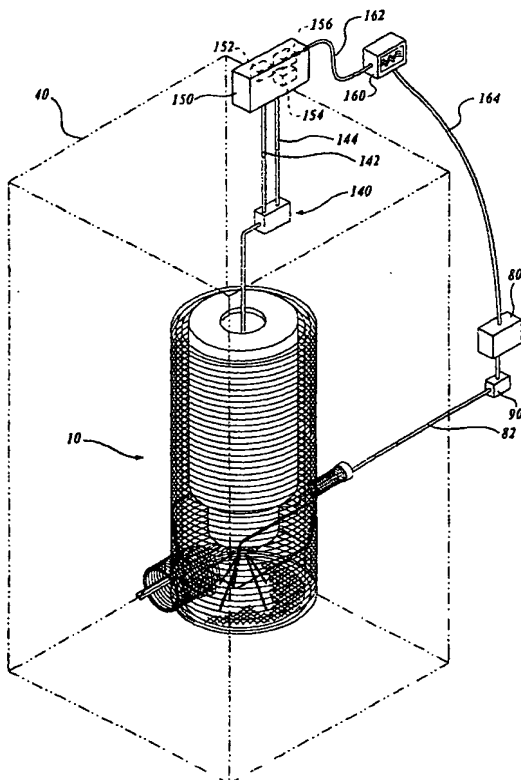
(74) Agents: **DALEY-WATSON, Christopher, J.** et al.; PERKINS COIE LLP, Patents-SEA, P.O. Box 1247, Seattle, WA 98111-1247 (US).

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(54) Title: SYSTEM AND METHOD FOR CHARACTERIZING A SAMPLE BY LOW-FREQUENCY SPECTRA



(57) Abstract: A method and apparatus for interrogating a sample that exhibits molecular rotation are disclosed. In practicing the method, the sample is placed in a container having both magnetic and electromagnetic shielding, and Gaussian noise is injected into the sample. An electromagnetic time-domain signal composed of sample source radiation superimposed on the injected Gaussian noise is detected, and this signal is used to generate a spectral plot that displays, at a selected power setting of the Gaussian noise source, low-frequency spectral components characteristic of the sample in a selected frequency range between DC and 50 kHz. In one embodiment, the spectral plot that is generated is a histogram of stochastic resonance events over the selected frequency range. From this spectrum, one or more low-frequency signal components that are characteristic of the sample being interrogated are identified.



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